Programming Languages Course Plan

Week 4: Functions and Closures – Introduction

- Sebesta: Chapter 9 (Subprogram basics, parameter passing concepts, referencing environments)
- PLAI: Functions, lambda expressions, function application

Week 5: Functions and Scope in Depth

- Sebesta: Chapter 9 (Closures, local environments, lifetime of subprogram variables)
- PLAI: Environment model of evaluation, closures capturing environments

Week 6: Data Types – Foundations

- Sebesta: Chapter 6 (Primitive types, design issues, type systems overview)
- PLAI: Representation of values (numbers, booleans, closures) in the interpreter

Week 7: Structured Data Types

- Sebesta: Chapter 6 (Arrays, strings, and type design trade-offs)
- PLAI: Extending value representations and interpreter support

Week 8: Expressions and Evaluation

- Sebesta: Chapter 7 (Expressions, operator precedence, side effects, evaluation order)
- PLAI: Evaluation rules in the interpreter (operational view of semantics)

Week 9: Control Structures

- Sebesta: Chapter 8 (Selection and iteration statements)
- PLAI: Conditionals and control flow in the interpreter

Week 10: Functional Programming Paradigm

- Sebesta: Chapter 15 (Functional languages concepts: recursion, immutability, higher-order functions)
- PLAI: Functional core already used — make connections explicit

Week 11: Advanced Functional Concepts

- Sebesta: Chapter 15 (Lazy evaluation, pure functions, functional design principles)
- PLAI: Higher-order functions and closures in practice

Week 12: Logic Programming Paradigm

- Sebesta: Chapter 16 (Logic programming, Prolog basics, unification, backtracking)
- PLAI: Conceptual comparison with functional and imperative evaluation

Week 13: Formal Syntax and Semantics

- Sebesta: Chapter 3 (BNF, syntax description, overview of semantic models)

- PLAI: Interpreter as an operational semantics model

Week 14: Lexical and Syntax Analysis

- Sebesta: Chapter 4 (Lexical analysis, parsing concepts, syntax trees)
- PLAI: Abstract syntax trees as input to the interpreter

Week 15: Integration and Review

- Sebesta: Review key concepts across chapters (scope, types, control, paradigms)
- PLAI: Full interpreter overview and conceptual integration